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09/606,326	06/29/2000	David Carmel	6727/OH370	7023

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Darby & Darby PC  
805 Third Avenue  
New York, NY 10022

EXAMINER

SPOONER, LAMONT M

ART UNIT PAPER NUMBER

2654

DATE MAILED: 08/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/606,326

Applicant(s)

CARMEL ET AL.

Examiner

Lamont M. Spooner

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-7,9-18,21-24,26-31 and 33-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-7,9-18,21-24,26-31 and 33-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 June 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/30/05 has been entered.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 1-3, 5-7, 9-18, 21-24, 26-31 and 33-35 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Objections***

3. Claim 15 is objected to because of the following informalities:

In claim 15, line 9, "of each in each" should probably be - in each- -. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 1-3, 9-13, 22-24, 26, 29, and ~~31-33~~<sup>30, 31, 33</sup> are rejected under 35 U.S.C. 103(a) as being unpatentable over Halstead, Jr. et al. (Halstead, US 5,963,893) in view of Oflazer et al. (Morphological Disambiguation by Voting Constraints).

As per **claims 1, 22 and 29**, Halstead, Jr. et al. discloses a method for morphological disambiguation comprising:

receiving an input string (C.6.lines 3-5)

morphologically analyzing the string to generate a list of candidate analyses (C.7.lines 24-29-list of candidate analysis each having word and pattern) of the string, each candidate analysis comprising a respective word, having a lemma (C.4.lines 1-18-his autonomous words and stems as lemmas) and a linguistic pattern of the word (C.6.lines 46-50-morphological analysis-the pattern includes postfixes bounded to stems) the pattern of the word, the pattern comprising a specification of at least one characteristic of the word, selected from a set of characteristics including a part of speech, prefix, number, gender and person of the word (Fig. 2 items 27, 32 –postfix analysis and prefix analysis, Fig. 8, also C.6.lines 1-67, C.7-C.8.line 6-“the paradigm roughly corresponds to a designation of part of speech. The morpheme also includes a “Next States” section. The “Next States” section specifies the states that may follow the morpheme to the right.”-there is a part of speech pattern associated to the word, and C.7.lines 14, 15, C.12.lines 31-33-prefix analysis included in the set, for the linguistic pattern , C.4.lines 14, 15, 19, 20) ; and

evaluating the pattern in each of analyses so as to determine a relative frequency of occurrence of the pattern in each of the analyses (C.7.C.8.-C.9.line 11-“Each of the

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paths in the postfix morphological map for each subsection of the input text is scored"- which includes the part of speech path and next state analysis, in the scoring step the frequencies are determined in order for the paths to be sorted/ranked); and

selecting from the list one or more of the analyses that comprise respective patterns whose frequency of occurrence is above a predetermined threshold (Fig. 2 item 33- output tokens, C.9.lines 6-11-"the top scoring paths of each morphological map are kept),

but lacks teaching evaluating the pattern in each of the analyses that so as to determine a relative frequency of occurrence of the pattern in each of the analyses, independent of the lemma to which the pattern is applied;

However, Oflazer teaches evaluating the pattern in each of the analyses that so as to determine a relative frequency of occurrence of the patten in each of the analyses, independent of the lemma to which the pattern is applied p.226.column 1 "we perform the follow, by ignoring the root/stem feature of the parses", p.223-his "koyu+[u]n as a pattern, his koyu as a lemma; his "koyu+[u]n" as a parse. Therefore, at the time of the invention, it would have been obvious to modify Halstead with Oflazer by having the paradigmatic morphological disambiguation independent of the lemma. The motivation for doing so would have been for disambiguation of highly agglutinative languages such as Turkish (p.222 abstract, column 2 para. 2).

As per **claim 9**, Halstead, Jr. et al. and Oflazer make obvious all of the limitations of claim 1 on which claim 9 depends. Halstead, Jr. et al. further discloses:

determining the relative frequency of occurrence comprises analyzing a corpus of text and finding the frequency of occurrence of the pattern in the corpus (C.10.lines 14-17).

As per **claim 10**, Halstead and Oflazer make obvious all of the limitations of claim 9 on which claim 10 depends. Halstead, Jr. et al. further discloses:

determining the relative frequency of occurrence comprises storing in a table the frequency of occurrence found in the corpus, and looking up the pattern in the table (C.10.lines 14-17, 30-35-the listings in the templates are interpreted as the table).

As per **claim 11**, Halstead, Jr. et al. and Oflazer make obvious all of the limitations of claim 1 on which claim 11 depends. Halstead, Jr. et al. further discloses:

selecting the at least one of the analyses comprises setting the threshold so as to control how many of the analyses from the list are selected (C.9.lines 9, 10).

As per **claim 12**, Halstead, Jr. et al. and Oflazer make obvious all of the limitations of claim 1 on which claim 12 depends. Halstead, Jr. et al. further discloses:

selecting the at least one of the analyses comprises selecting the at least one of the analyses based on the pattern thereof, and substantially independently of the respective word (C.10.lines 30-35-the entire pattern matching is based upon patterns and independent of the respective word).

As per **claim 13, 26 and 33**, Halstead, Jr. et al. and Oflazer make obvious all of the limitations of claim 1 on which claim 13 depends. Halstead, Jr. et al. further discloses:

searching in a corpus of text for a match to the input string using the one or more selected analyses (C.13.lines 45-48- "...may look for particular words..."-indicates searching, "content of text" is interpreted as the corpus, C.13.lines 55-57).

As per **claims 2, 3, 23, 24, 30, and 31**, Halstead and Oflazer make obvious all of the limitations of claim 1 on which claims 2 and 3 depend. Halstead, Jr. et al. further discloses:

the approach has applicability to natural languages other than Japanese (C.14.lines 9-10).

Therefore, it would have been obvious to one skilled in the art to choose Hebrew, as Semitic language as the input. The motivation for doing so would have been to expand the language selection options for disambiguation.

6. Claims 5-7, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Halstead, Jr. et al. in view of Oflazer and further in view of Zamora (US 4,862,408).

Halstead, Jr. et al., Oflazer and Zamora are analogous art in that they are both of the morphological analyses field.

As per **claim 5**, Halstead and Oflazer make obvious all of the limitations of claim 1 on which claim 5 depends. Halstead, Jr. et al. further discloses:

the specification of the at least one characteristic comprises a specification of the characteristics in the set (C.7.lines 14, 15, C.12.lines 31-33, C.4.lines 14, 15, 19, 20).

Halstead, Jr. et al. in view of Oflazer do not disclose:

the set of characteristics includes gender.

However, as it is well known in the art, Zamora et al. teaches affix portions specify gender. Therefore, at the time of the invention, it would have been obvious to modify Halstead, Jr. et al. with Zamora by including gender in the characteristics set. The motivation for doing so would have been to identify all inflectional forms of the morphological analyses, which include all forms of affixes (Halstead, Jr. et al. C.4.lines 16-21).

As per **claim 6**, Halstead, Jr. et al., Oflazer and Zamora make obvious all of the limitations of claim 5 on which claim 6 depends. Halstead, Jr. et al. further discloses:

when the base word comprises a verb, the linguistic pattern further comprises a designation of a tense and pattern of the verb (C.4.lines 10-15, C.7.lines 23-27).

Halstead, Jr. et al. does not disclose:

the designation of a conjugational pattern of the verb.

However, as it is well known in the art, Zamora teaches morphological analysis including the conjugational patterns derived from words (C.2.lines 50-55). Therefore, at the time of the invention, it would have been obvious to modify Halstead, Jr. et al. with Zamora by including the conjugation pattern of a verb in the linguistic pattern analysis. The motivation for doing so would have been to include the entire array of morphological analyses to the word for stem and postfix or prefix identification (Halstead, Jr. et al. C.4.lines 10-17).

As per **claim 7**, Halstead, Jr. et al. and Oflazer make obvious all of the limitations of claim 1 on which claim 7 depends. Halstead, Jr. et al. further discloses:



each of the analyses has a lemma (C.4.lines 11, 12-the lemma is the stem, C.9.lines 12-17) and a paradigm determined by the word and the linguistic pattern thereof (C.7.lines 5-8),

Halstead, Jr. et al. in view of Oflazer do not disclose:

and wherein evaluating the pattern comprises eliminating one of the analyses from the list if it has the same lemma and paradigm as another of the analyses.

However, as it is well known in the art, Zamora teaches eliminating one of the analyses from the list if it has the same lemma and paradigm as another of the analyses (C.4.lines 68, C.5.lines 1-5). Therefore, at the time of the invention, it would have been obvious to modify Halstead, Jr. et al. with Zamora by eliminating one of a duplicate pattern in the analysis. The motivation for doing so would have been to efficiently process content indexing or dictionary searching (Halstead, Jr. et al. C.13.lines 54-57, Zamora C.5.lines 4, 5).

As per **claim 14**, Halstead, Jr. et al. and Oflazer make obvious all of the limitations of claim 1 on which claim 14 depends. Halstead, Jr. et al. further discloses:

checking for spelling in the input string using the one or more selected analyses (C.1.lines 60-63, C.8.lines 27-31).

Halstead, Jr. et al. in view of Oflazer do not disclose:

checking for spelling errors in the input string using the one or more selected analyses.

However, as it is well known in the art, Zamora et al. teaches of checking for spelling errors in the input string using one or more of a selected morphological

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analyses method (C.5.lines 19-24). Therefore, at the time of the invention, it would have been obvious to modify Halstead, Jr. et al. with Zamora by checking for spelling errors as part of the analysis. The motivation for doing so would have been to identify the errors in the input string, which would be the directed benefit of having the spelling for morphological analyses of the input string (Halstead, Jr. et al. C.1.lines 60-63).

7. Claims 15-18, 21, 27, 28, 34, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zamora (US Patent No. 4,862,408 Aug. 29, 1989) in view of Halstead Jr, et al. and further in view of Oflazer.

Zamora, Halstead, Jr. et al. and Oflazer are analogous art in that they are both of the morphological analyses field.

As per **claims 15, 27 and 34**, Zamora discloses:

A method for searching a corpus of text made up of words comprising:

morphologically analyzing the words in the corpus to generate (C.2.lines 66-68), for each of at least some of the words (C.5.lines 56-58), a list of candidate analyses, each candidate analysis comprising a respective lemma and a linguistic pattern relating the lemma to the analyzed word (C.3.lines 1-10);

entering the lemmas of the selected analyses in an index of the corpus (C.6.lines 16-20); and

applying a search query to the index (C.6.lines 20-23).

Zamora does not disclose:

the linguistic pattern comprising a specification of at least one characteristic of the word, selected from a set of characteristics including a part of speech, prefix, number, gender and person of the word ; and

evaluating the pattern in each of analyses so as to determine a relative frequency of occurrence of the pattern in each of the analyses; and

selecting from the list for each of the analyzed words one or more of the analyses that comprise respective patterns whose frequency of occurrence is above a predetermined threshold.

However, Halstead teaches, the linguistic comprising a specification of at least one characteristic of the word, selected from a set of characteristics including a part of speech, prefix, number, gender and person of the word (Fig. 2 items 27, 32 –postfix analysis and prefix analysis, Fig. 8, also C.6.lines 1-67, C.7-C.8.line 6-“the paradigm roughly corresponds to a designation of part of speech. The morpheme also includes a “Next States” section. The “Next States” section specifies the states that may follow the morpheme to the right.”-there is a part of speech pattern associated to the word, and C.7.lines 14, 15, C.12.lines 31-33-prefix analysis included in the set, for the linguistic pattern , C.4.lines 14, 15, 19, 20) ; and

evaluating the pattern of each of analyses so as to determine a relative frequency of occurrence of the pattern of each of the analyses(C.7.C.8.-C.9.line 11-“Each of the paths in the postfix morphological map for each subsection of the input text is scored”-which includes the part of speech path and next state analysis, in the scoring step the frequencies are determined in order for the paths to be sorted/ranked); and

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selecting from the list for each of the analyzed words one or more of the analyses that comprise respective patterns whose frequency of occurrence is above a predetermined threshold (Fig. 2 item 33- output tokens, C.9.lines 6-11-"the top scoring paths of each morphological map are kept.). Therefore, at the time of the invention, it would have been obvious to one ordinarily skilled in the art to modify Zamora by incorporating a morphological characteristic linguist pattern and frequency evaluation thereof for token/result selection. The motivation for doing so would have been to sort and obtain only the top scoring paths/patterns which assists morphological disambiguation (C.9.lines 6-11).

Zamora in view of Halstead do not teach evaluating the pattern of each of analyses so as to determine a relative frequency of occurrence of the pattern of each of the analyses, independent of the lemma to which the patter is applied.

However, Oflazer teaches evaluating the pattern in each of the analyses that so as to determine a relative frequency of occurrence of the patter in each of the analyses, independent of the lemma to which the pattern is applied p.226.column 1 "we perform the follow, by ignoring the root/stem feature of the parses", p.223-his "koyu+[u]n as a pattern, his koyu as a lemma; his "koyu+[u]n" as a parse. Therefore, at the time of the invention, it would have been obvious to modify Zamora with Oflazer by having the paradigmatic morphological disambiguation independent of the lemma. The motivation for doing so would have been for disambiguation of highly agglutinative languages such as Turkish (p.222 abstract, column 2 para. 2).

As per **claims 16, 28 and 35**, Zamora, Halstead Jr, et al. and Oflazer make obvious all of the limitations of claim 15 on which claim 16 depends. Zamora further discloses:

receiving an input text string (Fig. 1 "input word")

morphologically analyzing (C.4.lines 13-16) and disambiguating (C.4.lines 65-68, C.5.lines 1-5-a disambiguation process), the string to generate one or more search lemmas for the string (C.4.lines 13-16, C.6.lines 20,21-indicates the search lemma); and

comparing the search lemmas to the index (C.6.lines 16-27-the lemmas are compared to the index, for recall and retrieval purposes).

As per **claims 17 and 18**, Zamora, Halstead and Oflazer make obvious all of the limitations of claim 15 on which claims 17 and 18 depend. Zamora further discloses:

applying a morphological analysis process to many natural languages (C.2.lines 45-55).

Therefore, it would have been obvious to one skilled in the art to choose Hebrew, as Semitic language as the input. The motivation for doing so would have been to expand the language selection options.

As per **claim 21**, Zamora, Halstead, Jr. et al. and Oflazer make obvious all of the limitations of claim 15, on which claim 21 depends. Zamora further discloses:

selecting the at least one of the analyses comprises selecting the at least one of the analyses based on the pattern thereof, and substantially independently of the respective word' (C.6.lines 17-20-selection from the paradigm process-interpreted as the pattern, independent of the respective word).

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**Conclusion**

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ezeiza et al. (Combining Stochastic and Rule-Based Methods for Disambiguation in Agglutinative Languages 1998), teaches statistical methods of disambiguating agglutinative languages, utilizing a training corpus, and also rule-based morphological disambiguation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lamont M. Spooner whose telephone number is 571/272-7613. The examiner can normally be reached on 8:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on 571/272-7602. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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08/08/05

Donald L. Stern  
PATENT EXAMINER  
AU 2654